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(54) Title: PROVISION OF A MULTIMEDIA MESSAGE
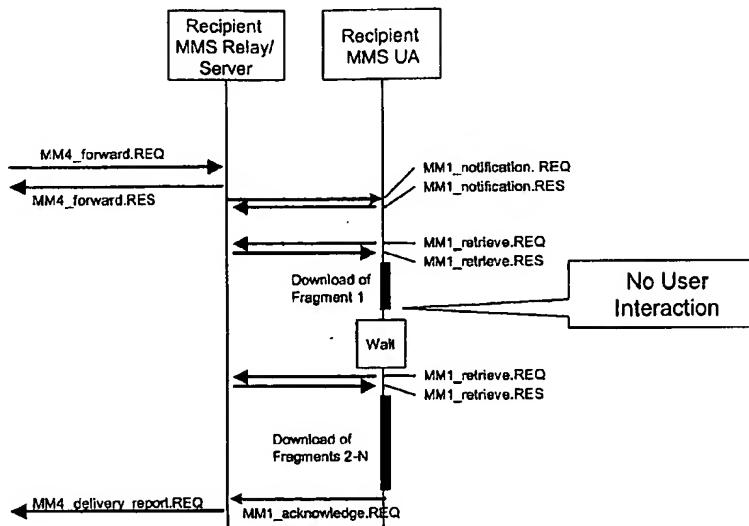
(57) Abstract: The idea of the present invention is to postpone the multimedia message delivery to those terminals, who have activated the download feature, but whose users are not immediately interested in watching the content. It is proposed to fragment a multimedia message into a first segment and in the at least one further segment. For the purpose of the present invention a wait timer is defined for postponing the delivery of the at least one further segment. The first segment is sent to all users and the user decides whether he or she wants to see the remaining parts of the message immediately. The first segment includes attributes allowing the user to make a decision and describing parameters of the waiting process.

WO 2006/050751 A1

Provision of a multimedia message

5 **Technical field of the invention**

The present invention relates to provision of multimedia
messages for telecommunications networks.

10 The present application might be used for delivery of
messages of a multimedia message service in a wireless
telecommunication network with a focus on an efficient usage
of the network resources.

15 Multimedia Messaging Service MMS is a standard that lets
users of MMS supportive mobile phones send and receive
messages with formatted text, graphics, photographs, audio
and video clips. Video sequences, audio clips and high-
quality images can be downloaded to the phone from suitable
20 network sides, transferred to the phone in a MMS message. MMS
messages can be sent either to another MMS-enabled mobile
phone or to an e-mail address and a MMS message can for
example be a photo or picture post card annotated with text
and/or an audio clip, a synchronized playback of audio, text,
25 photo and video emulating a free-running presentation or a
video clip. The Multimedia Messaging area covers both the
person-to-person communication as well as the content-to-
person mobile media sphere.

30 Multimedia messaging requires high transmission speeds. In
particular the transmission speed is an issue in wireless
telecommunication systems. Mobile telecommunications
networks, such as the third-generation wireless networks
(UMTS Universal Mobile Telecommunication System) or GPRS
35 (General Packet Radio System) aim to provide services such as

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voice, data, and multimedia via computing devices over
network infrastructures. Moreover, existing GSM networks
support the MMS technology by means of an additional
infrastructure, like a Multimedia Messaging Centre (MMC).

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Nowadays it is common to provide a node like the MMC being
responsible for supporting multimedia messaging in a network.
The Multimedia Messaging Center (MMC) implements the network
side of Multimedia Messaging Service, and makes it possible
10 to offer multimedia messaging to the mobile subscribers. The
MMC manages different sources to/from mobile terminals,
supporting a range of interfaces.

In addition to the submission and delivery of mobile
15 multimedia MM message, the MMC also offers functionality to
store and forward messages, guarantee delivery, provision of
subscriber preferences, customize operator constraints, and
track billing information.

20 In the following two nodes of a MMS architecture, which will
be further used as an embodiment of the present invention,
are described in some details, the MMS User Agent and the MMS
Relay/Server.

25 The MMS User Agent resides on a user side. It is an
application layer function that provides the users with the
ability to view, compose and handle MMS messages (e.g.
submitting, receiving, deleting of MMs).

30 The MMS Relay/Server is responsible for storage and handling
of incoming and outgoing messages and for transfer of the
messages between different messaging systems. Depending on
the network model, the MMS Relay/Server may be a single
logical element or may be separated into MMS Relay and MMS

Server elements. These may be distributed across different
locations in a network or even across different domains.

The MMS Relay/Server also provides convergence functionality
5   between External Servers and MMS User Agents and thus enable
the integration of different server types across different
networks.

Thus, the MMS Relay/Server provides for example the following
10   functionalities: receiving and sending von multimedia
messages MM, MM notification to the MMS User Agent;
generating delivery reports; routing forward MMs and read-
reply reports; address translation; temporary storage of
messages; ensuring that messages are not lost until
15   successfully delivered to another MMSE element;

The MMS architecture defines a number of interfaces providing
connection to different nodes within the architecture. In the
following some interfaces relevant for the present invention
20   are described shortly in respect to Fig.1. Fig.1 depicts
schematically a network with a MMS User Agent A communicating
with a MMS User Agent B over a corresponding MMS Relay/Server
A and MMS Relay/Server B nodes. Moreover, the interfaces, MM1
and MM4 between the certain nodes are shown.
25
MM1 is an interface between the MMS User Agent and the MMS
Relay/Server. It is used to submit multimedia messages from
MMS User Agent to MMS Relay/Server. Furthermore, over the MM1
the MMS User Agent pulls multimedia messages MM from the MMS
30   Relay/Server. The MMS Relay/Server pushes information about
the multimedia messages MMs to the MMS User Agent as part of
a multimedia message MM notification. The MM1 is also used to
exchange delivery reports between MMS Relay/Server and MMS
User Agents.
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The interface between MMS Relay/Server and another MMS
Relay/Server is called MM4 and is used to transfer messages
between these nodes.

5   A number of applications in the current telecommunication
     systems are one-to-many applications, where one or a few
     sources are sending data to many receivers. This kind of
     transmission is also foreseen in the MMS, wherein a group of
     users receiving the same content might be defined. For the
10   purpose of defining the groups of users an interface between
     the MMS Relay/Server and MMS Value Added Service VAS
     Applications, the MM7 is used. The responsibility of the VASP
     is to provide the MMS Relay/Server with group messages which
     are to be distributed amongst the recipients. In some cases,
15   the list of recipients is given in form of a "group id" (like
     a virtual MSISDN) and the MMSC need to resolve the individual
     phone numbers of the list members.

     In the following an exchange of multimedia messages is
20   described in respect to Fig.2, which shows an originator MMS
     User Agent UA communicating over MM1 interface with
     originator MMS Relay/Server, which subsequently communicates
     with recipient MMS Relay/Server over MM4 interface. The last
     mentioned node uses MM1 interface to transfer the messages to
25   a recipient MMS UA. Fig.2 presents the technical realisation
     of MMS service features in terms of abstract messages. The
     abstract messages can be categorised into transactions
     consisting of requests and responses. The labelling of the
     MMS abstract messages follows these conventions, wherein the
30   transactions between the MMS UA and MMS Relay/Server are
     prefixed with "MM1"; the transactions between the MMS
     Relay/Servers are prefixed with "MM4"; requests are
     identified with ".REQ" as a suffix and responses are
     identified with the ".RES" suffix.

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Multimedia messages are sent from the originator MMS UA to
the originator MMS Relay/Server, MM1_submit.REQ, and
forwarded to the recipient MMS Relay/Server, MM4_forward.REQ.
Before a message is sent to a further node, the reception of
5   the message is acknowledged to the sending node,
MM1_submit.RES, MM4_forward.RES. The recipient MMS
Relay/Server notifies the recipient MMS UA about the MMS,
MM1_notification.REQ, MM1_notification.RES, upon which the
recipient MMS UA retrieves the MMS content, MM1_retrieve.REQ.
10   The content retrieval, MM1_acknowledgement.REQ and the read-
reply, MM1_read_reply_recipient.REQ are acknowledged by the
recipient UA and returned to the originator MMS Relay/Server
and eventually to the originator MMS UA.

15   Hence it appears, that the information exchange according to
the MMS architecture is based on the store and forward
principle, wherein every node on the transmission way between
the communicating nodes stores the received message before
said message is forwarded to a subsequent node. This
20   principle ensures a peer-to-peer delivery and in the end a
end-to-end delivery of a message. However on the other side
said principle is time and resource consuming, in particular
in case of transmission of a large-scale multimedia message
to a group of users.
25
Currently, more and more operators offer content to person or
application to person messaging services, also called MMS-
Push services. Such services are group services, which
distribute the same information to a large set of registered
30   terminals.

The penetration rate of MMS compliant terminals is
increasing, therefore it is foreseen, that also the number of
potentially registered terminals per service is increasing.
35   Also the multimedia capabilities, such as resolution of the

displays are increasing, which means that the messages itself
can grow in size on average with high peak message sizes.
This evolution leads to some problems with resource
provision, because an increased amount of data is to be

5   transmitted over the network. If additionally the increasing
number of group services is considered, then the issue of
resource provision seems to be even more critical.

Currently a number of MMS retrieval modes are defined. MMS

10   allows the retrieval of MMs in a manual or automatic fashion.
The retrieval mode is a terminal behavior and is based on
different factors. These factors might include message size,
MMS User Agent configuration, recommendation from the MMS
Relay/Server for retrieval and the originator of a multimedia

15   message.

In manual mode the end user is made aware of the MM
notification and is allowed to make a decision whether to
download the MM or not. In this mode the end user is aware of

20   an MM notification.

In automatic mode, hereinafter also called auto-download, the
retrieval of a multimedia message MM and its storage to local
memory is accomplished without any interaction with the end

25   user. Depending on terminal implementation, the MM may be
displayed to the end user with or without any pre-notice.

The auto-download provides a more convenient access of the
user to the received multimedia messages MMSes since the user

30   get the multimedia message automatically into their
terminals. If the user has not recognised the reception of
the pre-notice notification, which might be implemented as
New-Message Alert, the terminal starts retrieving the message
on its own. Unfortunately, this type of download consumes the

35   same network resources as the retrieval procedures of

terminals with users who recognised the alert message and requested the downloading immediately. That results in the problem, that the downlink transmission path is loaded with traffic for users, who have recognise the notification
5 message and are waiting for the actual content, but also with traffic for users, who have not recognised the notification message, but have activated the auto-download function, which means that they do not want or they are not able to watch the multimedia message by receiving the notification.
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Summary and description of the invention

It is an object of the present invention to provide a solution for an efficient usage of network resources during
15 transmission of multimedia messages.

The invention is disclosed in claims 1, 12, 20 and 21. Advantageous embodiments are described in the dependent claims being disclosed in the corresponding parts of the
20 description.

The basic idea of the present invention is to provide a solution for a delivery of a multimedia message for a communication network having a user part and a network part
25 wherein the network part is responsible for distribution of the multimedia message to at least one user part and the method comprising the following steps to be performed by the network part. At first the network part provides a multimedia message, which is to be distributed. Subsequently a
30 fragmentation procedure is performed for fragmenting a message into a first segment and at least one further segment wherein the first segment includes information about a possibility of time-delayed reception of the at least one further segment of the multimedia message and a reference to
35 the at least one further segment. Subsequently the first

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segment is sent to the user part and a waiting process is
started according to the information about the possibility of
the time-delayed reception of the at least one further
segment of the multimedia message. Upon an event message is
5   received, the at least one further segment is sent to the
user. Herein it is to be emphasized, that the implementation
of the event might be performed in any preferably and
suitably way. For example it might be a message received form
the network side or from the user. Furthermore it might be
10   for example an expiration of a timer.

Further it is proposed to have a solution on the user part in
the above-defined network, wherein the user part receives a
first fragment of the multimedia message including
15   information about a possibility of time-delayed reception of
at least one further segment of the multimedia message and a
reference to the at least one further segment. Hereby it is
to be mentioned that the information about the possibility of
the time-delayed reception means that all users receive the
20   first fragment and the user decides considering said
information whether the at least one further segment is to be
downloaded immediately or time-delayed.

Subsequently a notification procedure for receiving the at
25   least one further segment of the multimedia message is
performed. Said notification procedure is to be performed
either user-driven by means of active requesting the
downloading of the remaining segments or time-delayed by
means of generation an automatically requesting of the
30   downloading of the remaining segments, for example by
consideration of a timer. Finally an appending procedure for
appending the received fragments into the multimedia message
is performed.

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Furthermore it is proposed to have a network part adapted to
deliver a multimedia message for a communication network
having a user part and said network part wherein said network
part is responsible for distribution of the multimedia
5   message to at least one user part. Said network part has a
provision logic providing a multimedia message that is to be
distributed. Herein the multimedia message might be either
generated in the network part or received from an extern al
node, for example a server. Further it has a fragmentation
10   controller for fragmenting a message into a first segment and
at least one further segment wherein the first segment is
adapted to include information about a possibility of time-
delayed reception of the at least one further segment of the
multimedia message and a reference to the at least one
15   further segment. The first segment is sent by a sender for
sending the first segment to the user part. A processor is
used which is adapted to perform a waiting process according
to the information about the possibility of the time-delayed
reception of the at least one further segment of the
20   multimedia message. Furthermore the network part has a sender
for sending the at least one further segment of the
fragmented multimedia message upon receiving an event
message.

25   Moreover it is proposed to have a user part adapted to
deliver a multimedia message for a communication network
having said user part and a network part wherein the network
part is responsible for distribution of the multimedia
message to at least one user part. Said user part has a
30   receiver for receiving a first fragment of the multimedia
message including information regarding a waiting process for
a possibility of time-delayed reception of at least one
further segment of the multimedia message and a reference to
the at least one further segment. Further it has a processor
35   for performing the waiting process according to the

information about the possibility of the time-delayed
reception of the at least one further segment of the
multimedia message. A controller for performing a
notification procedure for receiving the at least one further
5   segment of the multimedia message is also a part of the user
part. The received fragments are appended into the multimedia
message by means of an appendix logic.

The present invention discloses also a system adapted to
10   deliver a multimedia message for a communication network
having a user part and a network part wherein the network
part is responsible for distribution of the multimedia
message to at least one user part and with the network part
according to claim 19 performing the method according to
15   claim 1 and communicating with the at least one user part
according to claim 20 performing the method according to
claim 12.

The advantage of the present invention is that the overall
20   service perception would be increased, because those
terminals with waiting users are served first and those
terminals with background auto-download mode are served at a
later stage, because the download for this group is to be
postponed to a later stage.

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In the following preferred examples of the present invention
shall be described in detail, in order to provide the skilled
person with thorough and complete understanding of the
invention, but these detailed embodiments only serve as
30   examples of the invention and are not intended to be
limiting. The following description shall make reference to
the enclosed drawings, in which

Fig.1   shows a schematic representation of a multimedia
35   messaging network architecture,

Fig.2   shows a schematic representation of messages
exchange according to state of the art,

5   Fig.3   shows a flowchart of an embodiment of the present
invention for delivery of a multimedia message in the network
part,

Fig.4   shows a flowchart of an embodiment of the present
10   invention for delivery of a multimedia message in the user
part,

Fig.5   shows a schematic representation of messages
exchange according to one embodiment of the present invention
15   with a timer located in the user part,

Fig.6   shows a schematic representation of messages
exchange according to one embodiment of the present invention
with a timer located in the network part,

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Fig.7   shows a schematic representation of messages
exchange according to one embodiment of the present invention
with a user's interaction during running timer.

25   It should be noted that the terms "relay", "user", "server",
or generally "node" in the context of the present invention
refers to any suitable combination of hardware and software
for providing a predetermined functionality in the
communication network. In this way, said terms generally
30   refers to a logical entity that can be spread out over
several physical nodes of the network, but can also refer to
a physical entity located in one physical node.

Furthermore it should be noted that the term multimedia
35   messaging refers to any large-scale message, which might be

fragmented in a certain way. A multimedia message refers for example to music, videotext or video-clips, wherein one message can contain a number of multimedia file and the fragmentation is done in respect to the included files.

5   Hence, the invention is not restricted to the Multimedia Message Service, which merely is used as a preferred embodiment.

Preferably, the communication network is a mobile
10 communication network, e.g. is a mobile communication network operating according to GPRS (General Packet Switched Radio) or UMTS (Universal Mobile Telephone System) or GSM. However, the present invention is also applicable in any communication network providing multimedia messaging.

15

The idea of the present invention is to postpone the multimedia message delivery to those terminals, who have activated the download feature, but whose users are not immediately interested in watching the content. Thus, in the
20 frame of the present invention a new user group is defined. This group includes users, who activated the auto-download feature, but who are not immediately interested in the content. This kind of users activates the auto-download mode, because they want to have the content available in their
25 terminal, although they do not want or can watch it immediately. Since those users have activated the auto-download feature, they also expect some play-out immediately or at least quickly, that means they do not want to spend time for downloading. The difference to users with the manual
30 retrieval mode is that they download the multimedia message by means of an explicit requesting the downloading.

In order to achieve the goal the following solution is presented. Herein a differentiation is made regarding the
35 place of performance certain steps. The differentiation is

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made between a network part and a user part. The steps to be performed in the network side are described in the following in respect to Fig.3.

5   The network part might be implemented in any suitable combination of hardware and software being able to perform hereafter described steps. In this way, said terms generally refers to a logical entity that can be spread out over several physical nodes of the network, but can also refer to

10   a physical entity located in one physical node, like for example the MMS Relay/Server.

The user part is to be implemented preferably on the user equipment.

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According to Fig.3 a received multimedia message, S31 is to be subdivided into two or more fragments, S32. In the preferred embodiment it is proposed to consider multimedia messages being foreseen for a group of user. However the

20   invention is not restricted to this kind of messages. Thus, the present invention is also applicable to a multimedia message for a single user.

In a preferred embodiment it is proposed that the

25   fragmentation procedure includes the organization of the multimedia components within the message for progressive play-out. The first segment includes further attributes of the multimedia message specifying behaviour of the user part receiving the multimedia message. The receiver behaviour

30   describes the process to get the next fragment. It describes, if the receiver needs to fetch the next fragment by itself or it just needs to wait until the network provides the next fragment. Moreover it might be for example information regarding mechanisms to download the remaining fragments,

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which are an indication to wait for the network trigger or
value or value-range for the user's terminal wait timer or
URLs or URL construction rules for the next fragments or
optionally a unique identifier to relate further fragments to
5   the first fragments.

Preferably, the message length and a prediction of group size
mainly determine the waiting time between the first and the
further fragments. In case of subscription services
10   (services, where a terminal needs to register with its
identifier with the network), the network knows exactly the
size of the total group. Important for the calculation of the
wait timer is share of users, who would like to see the
message immediately. For example a following scenario is
15   given: total group size: 100.000 users; expected share of
users, who are interested to see the clip immediately: 40%,
group estimation to calculate the wait time: 40.000 users,
then for this example, the waiting time would depend on "How
long does it take, that 40.000 users retrieve the entire
20   message (e.g. 3Mbyte) and 60.000 users only retrieve the
first fragment. (e.g. 0.5Mbyte)."

Preferably it is proposed that the length of the first
fragment of the message is chosen in such a way, that the
25   terminal can download a next fragment, while playing-out the
first segment. This principle can be repeated for all further
parts of the message. It is to be noted that the dimensioning
of the first fragment depends also on the capabilities of the
access network.
30
Furthermore it is proposed that the further attributes are
included in a header, which is inserted into the first
segment. Said header specifies the fragmentation and includes
a unique reference to the next message fragment.
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The result of the fragmentation procedure is a multimedia
message being subdivided in a first segment and in at least a
further segment. The number of segments might depend on
message size, the audience sizes and the operator's
5   preference for this procedure.

Furthermore in case the network part sends a segment during a
congestion of the network then the segment might include
information that the remaining part is in the subsequent
10   segments. Thus, the description of a previous fragment or the
total message may be part of a later fragment.

Upon the fragmentation procedure is finished, the network
part sends a first segment to the user, S33. It is to be
15   noted, that preferably the notification message is sent to a
group of users being interested in receiving the message.
Possible methods of building users' group for a certain kind
of multimedia messages are out of scope of the present
invention. The notification message in this context might be
20   realised in any suitably way. In one embodiment the
notification message is the first segment being sent to the
group of users. Alternatively it is proposed that the network
part sends a notification message and upon receiving an
answer from a user the first fragment of the message is to be
25   sent. The advantage of the last mentioned solution is a
simpler integration into systems having a separated
notification message implemented.

It is proposed that the network part determines the waiting
30   process and when the first segment is sent out the waiting
process is started. In the frame of the waiting process a
timer is started and upon elapsing of said timer an event
message is generated to trigger sending of the at least one
further segment of the multimedia message. In respect to
35   Fig.3 a waiting process is started is step S34. In this phase

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the network part waits for receiving an event requesting
sending of the remaining fragments, S35, wherein the
implementation is to be realised in any suitable way. In one
embodiment it is proposed to have a timer running on the
5   network side. The elapsing of said timer without receiving
any request from the user results in an event for starting
with the sending of the remaining segments. In a further
embodiment it is proposed that the network part waits for
receiving a request message from the user part. Herein the
10   timer is implemented on the user side and upon expire of the
timer a request message is sent to the network part unless
there is an interaction from the user in the meantime then
the request message is sent before the expiration of the
timer.
15

When the network part determines a waiting process this is to
be sent with the first segment to the user part. Therefore
the first frame must contain a description of the waiting
procedure, fixed pre-determined waiting time or random
20   waiting time or the retrieval procedure and the object to
retrieve (e.g. URL). In case a random waiting time procedure,
the UE determines the waiting time randomly by itself. A
minimal and maximal waiting time (or an offset and a random
window) is specified. Further more the time might be a
25   description of a specific trigger message. Preferably the
waiting timer is determined by a length of the multimedia
message and a prediction of a group size of user parts
receiving the multimedia message.

30   Finally the remaining fragments of the multimedia message are
sent to the users, S36.

In the following the steps are described which are to be
performed on the user part in respect to Fig.4.
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On the user part the terminals download the first fragment of
a multimedia message, S41, wherein the first fragment
includes further attributes of the multimedia message
specifying downloading process of said multimedia message.

5   Herein the information regarding downloading process includes
an indication to wait for the network trigger or value or
value-range for the user's terminal wait timer or URLs or URL
construction rules for the next fragments or optionally a
unique identifier to relate further fragments to the first

10   fragments.

Further it is proposed that the information regarding
downloading process includes information about an
implementation of a timer for triggering a downloading of the

15   at least one further segment. Thus, the received first
segment includes the information regarding the content of the
message and the waiting process.

The proposed timer might be a random wait timer or a

20   description of a specific trigger message. The implementation
of the timer might be either on the user part or in the
network part and the user part receives a notification about
the expiry of the timer.

25   Furthermore it is proposed that a user part which decides
during the waiting process to download the at least one
further segment sends an explicit request for downloading the
at least one further segment.

30   Furthermore the first segment might include further
information regarding the mechanisms to download the
remaining fragments, like for example an indication to wait
for the network trigger or value or value-range for the
user's terminal wait timer or URLs or URL construction rules

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for the next fragments or optionally a unique identifier to relate further fragments to the first fragments.

In case a user would like to watch content on a later stage,
5   the users' terminals need to process the received first part
    to determine the handling of this message. As aforementioned
    the first part of the message may contain different
    information. For example regarding the implementation of the
    timer before downloading the remaining parts. This might be
10 for example either a random wait time or a description of a
    specific trigger message. In particular the timer is to be
    set in a way that on one side it does not last to long before
    a request for downloading is sent. On the other side with the
    timer delay it should be achieved that a parallel downloading
15 of multimedia messages for users being immediately interested
    and for those who are not, is avoided.

Returning to Fig.4, a user part receives the first fragment
and decides to start the waiting process and according to the
20 current availability of the user, a notification procedure,
    S42 is started. Herein it is to be distinguished whether the
    notification is user-driven, S43 or time-delayed, S44. Herein
    is to be noted, that the user-driven notification might be
    either performed immediately after receiving the first
25 segment or during a running timer.

The succeeding fragments are downloaded directly only by
those terminals, which have users being interested in an
immediate viewing of the message, S43. The immediately
30 ability of the user to watch a content is accomplished by
    performing an interaction with the terminal. Herein it is to
    be mentioned that preferably upon the receipt of the first
    fragment the rendering process has been started since the
    first message includes already parts of the multimedia
35 message. Moreover, a user-driven notification procedure is

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performed in case a user does not react immediately but
delayed during the running timer. That means is proposed that
a user, who does not immediately react after receiving the
first fragment, has also a possibility to react during the

5   running timer. That means in case a user does not react
immediately and a timer has been started the user should not
be bound by the running timer, but a possibility is to be
provided to request the downloading of the remaining
fragments also during the waiting period. Preferably, it is

10   proposed that a user by means of a user interface sends a
request message to the network part.

The remaining terminals, which are not interested immediately
in view the multimedia message wait with the downloading of

15   the remaining fragments by starting a time-delayed
notification procedure, S44 and by waiting until the timer
expires. The time-delayed procedure might be realized in any
suitably way. In one embodiment it is proposed to have a
timer being started on the user side. The elapsing of the

20   timer causes a notification to the user for requesting the
remaining fragments. In a further embodiment it is proposed
to start a timer in the network part and upon elapsing the
timer, the network part might either starts to send the
remaining parts of the multimedia message or it might sends a

25   notification message to the user in order the user requests
the remaining parts.

In the last step, S45 the user's terminal appends the
received fragments of the multimedia message. Herein the

30   appending of a second to a first fragment might happen while
the first part is already displayed on the screen.

In the following a description of a preferred embodiment of
the present invention in accordance with MMS is provided.

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In this embodiment it is proposed that a node, called
Multimedia Message Service Centre MMSC fragments the
Multimedia Message into several fragments. Said MMSC server
might receive the MMS message over the MM7 interface from an
5   external network. Each fragment becomes an individual file,
which can be addressed via an URL. The MMSC indicates the
fragmentation and also the link to the next fragment in the
first fragment. The MMS also indicates the trigger mechanism,
which might be a part of the first fragment for starting
10   downloading the remaining fragments of the MMS.

It is the task of the user's terminal to append the received
fragments of a message to the first fragment, wherein the
appending of a second to a first fragment might happen while
15   the first part is already displayed on the screen. It is
preferably that the length of the first fragment is roughly
determined by the download time of the next fragment. This
approach enables a smooth progressive download since it is
possible to finish the download of the next fragment before
20   finishing the play-out of the first segment.

In the following, the individual steps of the distribution
process in respect to Fig. 5, Fig.6 and Fig.7 are described
in more details. The figures present a chronological exchange
25   of messages between a recipient MMS Relay/Server and a
recipient MMS UA.

In the first step the recipient MMS Relay/Server receives the
group MMS message. In Fig.5 it is received by means of
30   MM4_forward.REQ and MM4_forward.RES messages, but as
mentioned before it can be also by means of the MM7 interface
for communication with other domains. Upon receiving the MMS
message the recipient MMS Relay/Server fragments the message
into several smaller parts. Each fragment may be retrieved by
35   recipient MMS UA via different URL.

In a subsequent step the recipient MMS Relay/Server sends a
notification message, MM1_notification_REQ and
MM1_notification_RES, to all User Agents in that group. The
5   notification message contains a URL to the first fragment of
the MMS.

Hence, upon receiving the notification message, the recipient
MMS UA starts downloading the first fragment in case the
10   auto-download option is activated. This is done by means of
exchanging the messages, MM1_retrieve.REQ and
MM1_retrieve_RES. Preferably, the user is notified about the
downloading of a first fragment via the User Interface.

15   In this phase the recipient MMS UA might react in two
different ways. In case the user is interested in receiving
the entire MMS message immediately it sends directly a
request for the remaining fragments. This reaction is shown
in Fig. 7 by means of the second the second MM1_retrieve.REQ
20   and MM1_retrieve_RES exchange being sent without any time
delay. Thereafter the download of fragments 2-N is carried
out. Thus, the user agent, recipient MMS UA starts to
download the remaining fragments immediately. The fragments
may be downloaded one by one before starting the rendering
25   process or even in a progressive download way. The received
fragments may be merged locally in the user's terminal as the
user has the ability to append the received information of
further fragments to the first file. Optionally, the
remaining part of the multimedia message might be streamed to
30   the user. In this case the content is provided via a
streaming server and the UE uses automatically the streaming
application in the phone to render the next fragments.
Optionally, the content download via MMS is completed some
time after the streaming transmission. This option (and the
35   configuration) depends on operator preferences.

Alternatively before sending a direct request, the user might want to process the header information for finding flags for the fragmented MMS delivery in order to take a decision

5   whether to download directly or time-delayed.

However, if there is no user interaction for a defined time, then the user agent has processed the header information. The header describes available mechanisms to download the

10   remaining fragments of the multimedia message. Herein two different choices might be provided.

The first possibility is that the user's terminal starts a timer. This alternative is depicted in Fig.5 showing a

15   waiting timer on the recipient MMS UA side. After a timer in the user's terminal is expired, the retrieval of the remaining parts is started. The timer value can be random chosen by the user agent or be a part of the header information. In the first case, preferably the upper bound

20   for the random interval is contained in the header. In the later case the timer value is be explicitly contained in the header. In this case, the MMSC or recipient MMS Relay/Server may need to provide each user agents with its own timer-value within the first message fragment.

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The header also contains the URL(s) of the next fragments. The URLs may be given explicitly (one or more URLs) or a method is to be provided how to construct the URL, whereby the sequence number is part of the URL.

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In an alternatively embodiment it is proposed to have the waiting process being triggered by the network part as it is depicted in Fig.6 showing a waiting timer on the recipient MMS Relay/Server side. In this case the network sends another

35   notification message (i.e. SMS) to trigger the downloading

process of the remaining fragments, MM1_notification_REQ and MM1_notification RES. The notification message contains a unique reference to the fragmented message. Since the user keeps track on the received messages, it is known to the user

5   that this is a subsequent fragment. And therefore the user agent appends the received fragment to the previous fragment.

Subsequently in all cases the downloading of the fragments 2-N is performed. Closing, the receipt of the entire message is

10 acknowledged to the recipient MMS Relay/Server, MM1_acknowledge.REQ and subsequent to the sending node, herein by means of MM4 delivery report.REQ.

The preferred embodiment was based on the MMS although it

15 should not be seen as a restriction to the present invention. In fact the proposed method can be used for any kind of multimedia message which can be fragmented. For instance the method can be used for WAP-Push messages. Moreover the presented embodiments show the applicability of the present

20 invention for submission of multimedia messages to a group of users. However, the same procedure applies also for submission of a multimedia message to a single user.

However these are merely examples showing that by means of

25 interfaces additional information might be queried to ensure a better performance of the resource management procedure according to the present invention.

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Claims

1. Method for delivery of multimedia message for a
   communication network having a user part and a network
   part wherein the network part is responsible for
   distribution of the multimedia message to at least one
   user part and the method comprising the following steps
   to be performed by the network part
   - providing a multimedia message to be distributed
     and,
   - performing a fragmentation procedure for
     fragmenting a message into a first segment and at
     least one further segment wherein the first
     segment includes information about a possibility
     of time-delayed reception of the at least one
     further segment of the multimedia message and a
     reference to the at least one further segment and,
   - sending the first segment to the user part and,
   - performing a waiting process according to the
     information about the possibility of the time-
     delayed reception of the at least one further
     segment of the multimedia message and,
   - upon receiving an event message sending the at
     least one further segment of the fragmented
     multimedia message.

2. Method according to claim 1 wherein the multimedia
   message consists of one or several data files being
   constricted in a way to allow progressive playout.

3. Method according to claim 1 wherein the first fragment
   includes further attributes of the multimedia message

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specifying behaviour of the user part receiving the
multimedia message.

4. Method according to claim 3 wherein a length of the
   first fragment is determined by the download time of the
   at least one further segment.

5. Method according to claim 1, 3, 4, 5 or wherein in the
   fragmentation procedure it is considered that the first
   fragment contains at least a full header of the
   multimedia message.

6. Method according to claim 1 wherein the waiting process
   includes starting of a timer and upon elapsing of said
   timer an event message is generated to trigger sending
   of the at least one further segment of the multimedia
   message.

7. Method according to claim 1 wherein the waiting process
   is a waiting state for receiving a request message from
   the user part.

8. Method according to claim 1 wherein the waiting process
   is a wait timer being determined by a length of the
   multimedia message and a prediction of a group size of
   user parts receiving the multimedia message.

9. Method according to claim 3, 6, 7 or 8 wherein the first
   segment includes information about an implementation of
   a timer for triggering a downloading of the at least one
   further segment.

10.   Method according to claim 9 wherein the timer is a
   random waiting timer or a description of a specific
   trigger message.

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11.   Method according to claim 9 or 10 wherein the
       timer is implemented on the network part.

5   12.   Method for delivery of multimedia message for a
            communication network having a user part and a network
            part wherein the network part is responsible for
            distribution of the multimedia message to at least one
            user part and the method comprising the following steps
10   to be performed by the user part
               - receiving a first fragment of the multimedia
                 message including information regarding a waiting
                 process for a possibility of time-delayed
                 reception of at least one further segment of the
15   multimedia message and a reference to the at least
                 one further segment and,
               - performing the waiting process according to the
                 information about the possibility of the time-
                 delayed reception of the at least one further
20   segment of the multimedia message and,
               - performing a notification procedure for receiving
                 the at least one further segment of the multimedia
                 message and,
               - performing an appending procedure for appending
25   the received fragments into the multimedia
                 message.

     13.   Method according to claim 12 wherein the first
            fragment includes further attributes of the multimedia
30   message specifying downloading process of the multimedia
            message.

     14.   Method according to claim 12 or 13 wherein the
            information regarding downloading process includes

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information about an implementation of a timer for
triggering a downloading of the at least one further
segment.

5   15.   Method according to claim 14 wherein the timer is
            a random wait timer or a description of a specific
            trigger message.

      16.   Method according to claim 12, 13 or 14 wherein the
10   timer is implemented in the user part.

      17.   Method according to claim 12, 13 or 14 wherein the
            timer is implemented in the network part and the user
            part receives a notification about the expiry of the
15   timer.

      18.   Method according to one of the claims 12 to 17
            wherein during the waiting process a user part sends an
            explicit request for downloading the at least one
20   further segment.

      19.   Network part adapted to deliver a multimedia
            message for a communication network having a user part
            and said network part wherein said network part is
25   responsible for distribution of the multimedia message
            to at least one user part and has
            -   provision logic providing a multimedia message
                that is to be distributed and,
            -   fragmentation controller for fragmenting a message
30   into a first segment and at least one further
                segment wherein the first segment is adapted to
                include information about a possibility of time-
                delayed reception of the at least one further

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segment of the multimedia message and a reference
to the at least one further segment and,

- sender for sending the first segment to the user
part and,

- processor for performing a waiting process
according to the information about the possibility
of the time-delayed reception of the at least one
further segment of the multimedia message and,

- sender sending the at least one further segment of
the fragmented multimedia message upon receiving
an event message.

20.   User part adapted to deliver a multimedia message
for a communication network having said user part and a
network part wherein the network part is responsible for
distribution of the multimedia message to at least one
user part and with

- receiver for receiving a first fragment of the
multimedia message including information regarding
a waiting process for a possibility of time-
delayed reception of at least one further segment
of the multimedia message and a reference to the
at least one further segment and,

- processor for performing the waiting process
according to the information about the possibility
of the time-delayed reception of the at least one
further segment of the multimedia message and,

- controller for performing a notification procedure
for receiving the at least one further segment of
the multimedia message and,

- appendix logic for appending the received
fragments into the multimedia message.

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21.   System adapted to deliver a multimedia message for
       a communication network having a user part and a network
       part wherein the network part is responsible for
       distribution of the multimedia message to at least one
5   user part and with the network part according to claim
       19 performing the method according to claim 1 and
       communicating with the at least one user part according
   to claim 20 performing the method according to claim 12.

10

Fig.1


Fig.2

```
┌─────────────────────────────┐
│ Receiving a multimedia       │   S31
│ message                      │
└─────────────────────────────┘
            │
            ▼
┌─────────────────────────────┐
│ Performing a fragmentation   │   S32
│ procedure                    │
└─────────────────────────────┘
            │
            ▼
┌─────────────────────────────┐
│ Sending a first fragment to  │   S33
│ a user                       │
└─────────────────────────────┘
            │
            ▼
┌─────────────────────────────┐
│                              │
│ Waiting process              │   S34
│                              │
└─────────────────────────────┘
            │
            ▼
┌─────────────────────────────┐
│                              │
│ Receiving an event message   │   S35
│                              │
└─────────────────────────────┘
            │
            ▼
┌─────────────────────────────┐
│ Sending remaining fragments  │   S36
│ of the multimedia message    │
└─────────────────────────────┘
```
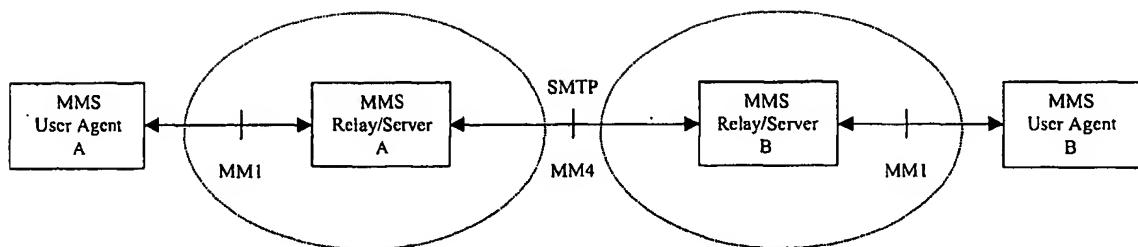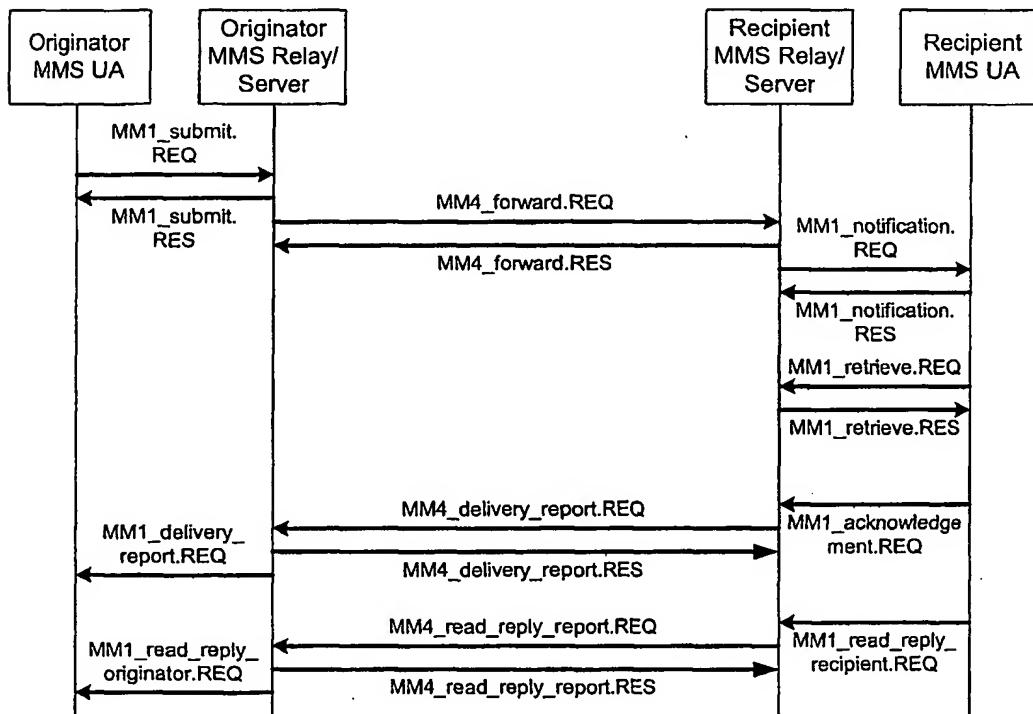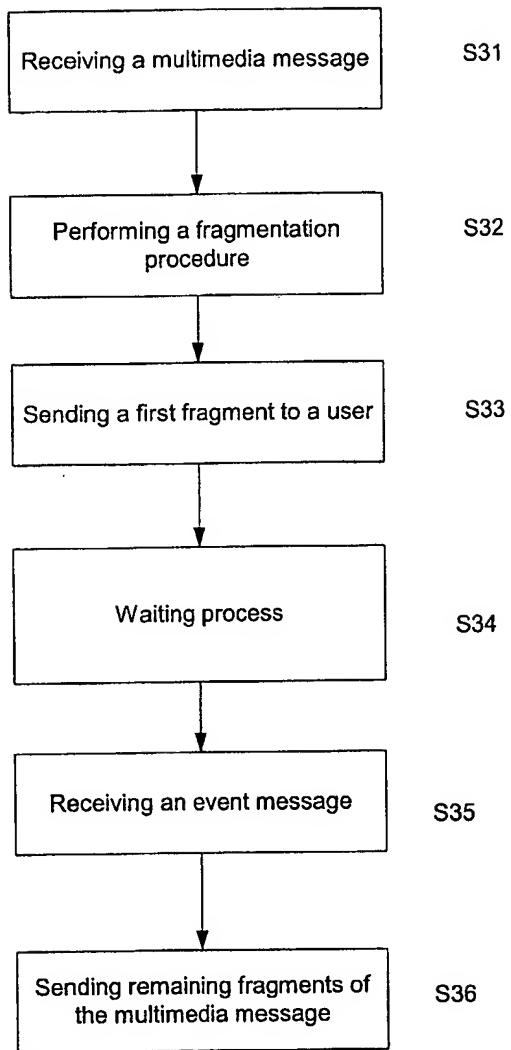
Fig.3
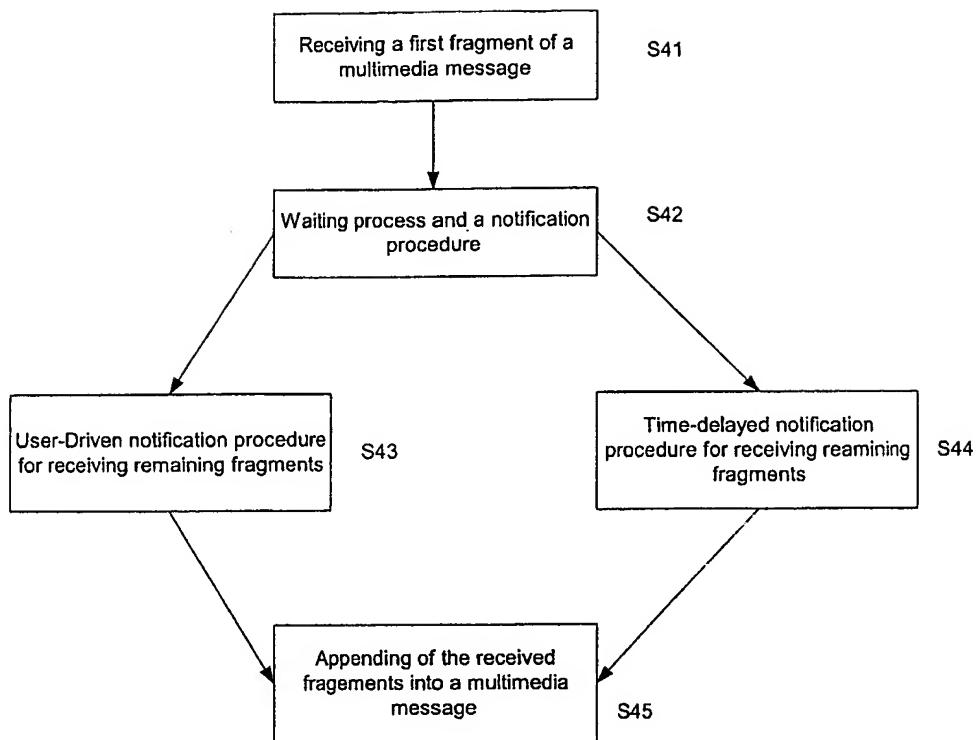
Fig.4
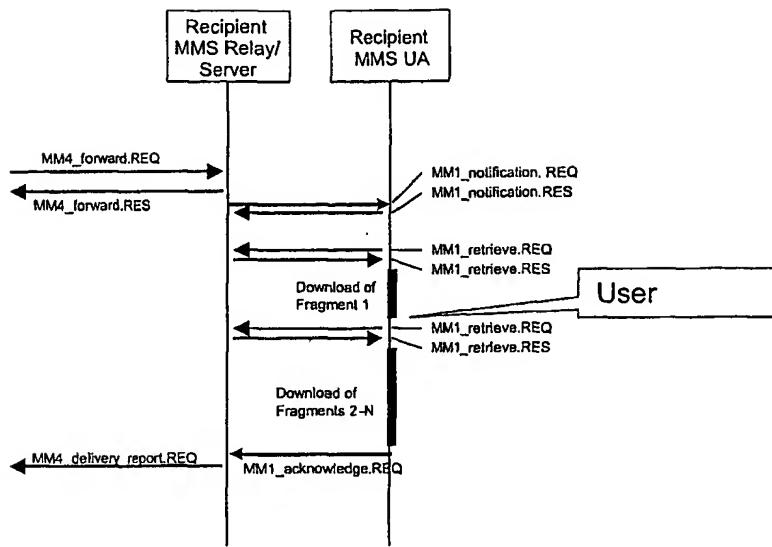
Fig.7
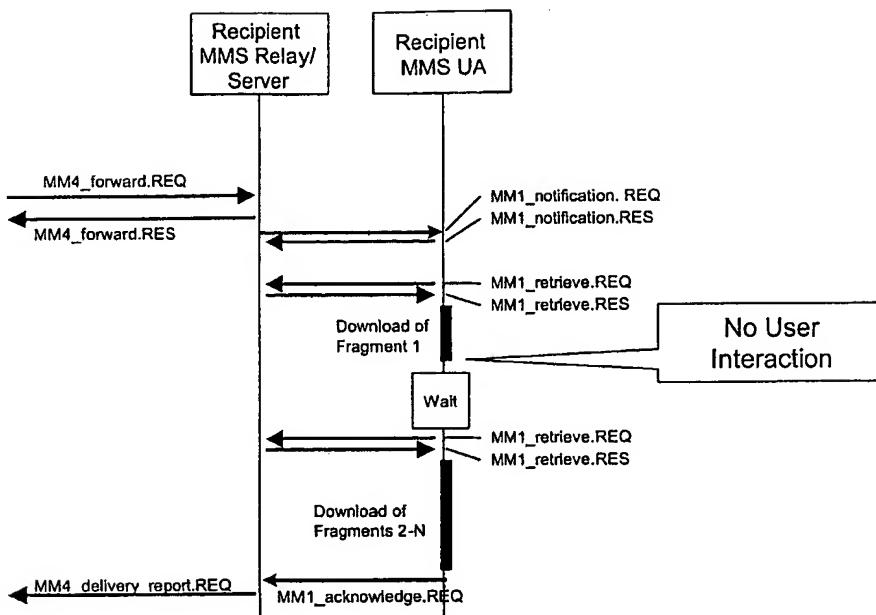
Fig.5
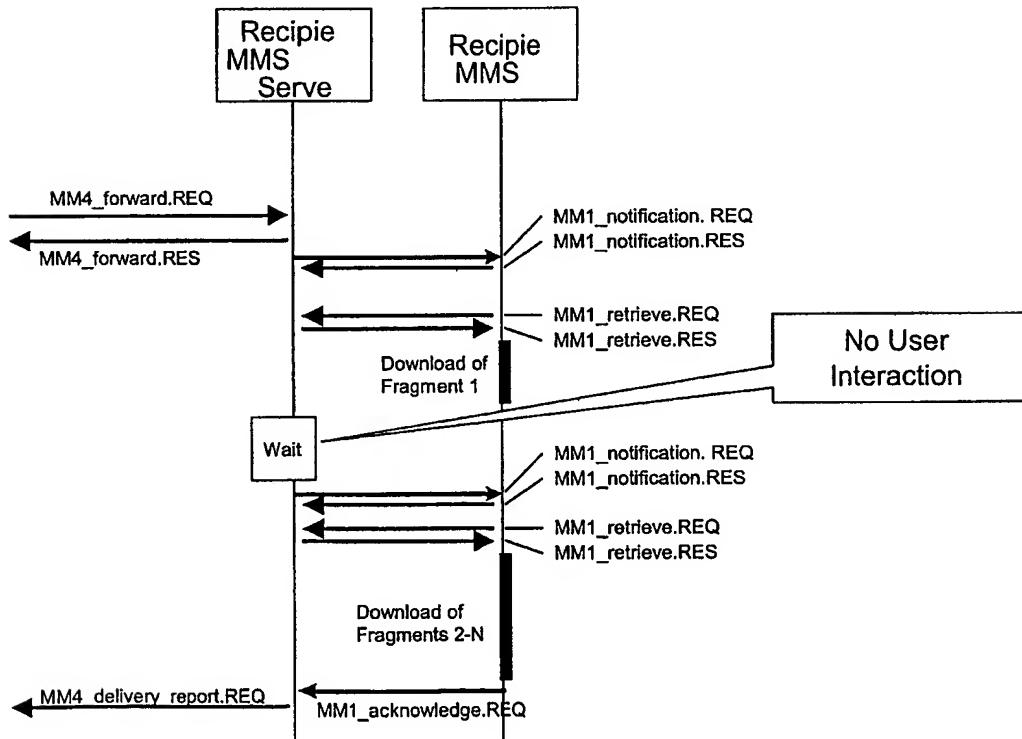
Fig.6

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7   H04Q7/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7   H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2004/056067 A (KONINKLIJKE PHILIPS ELECTRONICS N.V; SHAO, XIAOLING; TU, JIAWEN; FENG,) 1 July 2004 (2004-07-01) page 3, line 20 - page 4, line 7 page 5, line 19 - page 7, line 20 -----	1-21
X	US 2003/227916 A1 (PAILA TONI ET AL) 11 December 2003 (2003-12-11) paragraph '0004! paragraph '0040! - paragraph '0042! paragraph '0045! -----	1-21
X	US 2002/044634 A1 (ROOKE MICHAEL ET AL) 18 April 2002 (2002-04-18) paragraph '0006! - paragraph '0010! paragraph '0037! - paragraph '0046! -----	1-21

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☒ Patent family members are listed in annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the International search report
9 June 2005	20/06/2005

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Rothlübbers, C

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